

Claims

- [c1] A conduit for suspension in a wellbore, comprising:
a length of conduit; and
a cable inserted into the conduit, the cable having buckles, each buckle adapted to contact an interior surface of the conduit at a plurality of locations across substantially the entire length of conduit to prevent longitudinal movement of the cable within the conduit.
- [c2] The conduit of claim 1, wherein the cable directly contacts the interior surface of the conduit.
- [c3] The conduit of claim 1, wherein the conduit comprises a plurality of lengths of jointed tubing.
- [c4] The conduit of claim 1, wherein the conduit comprises a length of coiled tubing.
- [c5] The conduit of claim 1, wherein the cable is an electric power cable.
- [c6] The conduit of claim 5, further comprising an electric submersible pumping system operatively connected to one end of the electric power cable.

- [c7] The conduit of claim 6, wherein the electric submersible pumping system is connected to one end of the conduit.
- [c8] The conduit of claim 1, wherein a compressive force on the cable is less than a total weight of the cable.
- [c9] The conduit of claim 1, wherein the cable buckles to form a substantially uniform helix or sinusoid within substantially the entire length of conduit.
- [c10] An electric submersible pumping system, comprising:
a length of conduit for suspension within a wellbore;
a pump operatively connected to an electric motor, with the pump connected to one end of the conduit; and
an electric cable disposed within the conduit, the electric cable defining an arcuate path along substantially the entire length of conduit such that the electric cable buckles and contacts an interior surface of the conduit at a plurality of locations to prevent longitudinal movement of the electric cable within the conduit.
- [c11] The electric submersible pumping system of claim 10, wherein the conduit comprises a plurality of lengths of jointed tubing.
- [c12] The electric submersible pumping system of claim 10, wherein the conduit comprises a length of coiled tubing.

- [c13] The electric submersible pumping system of claim 10, wherein the electric cable is disposed within the conduit at a surface location.
- [c14] A method of installing a cable within a length of conduit at a location above the wellhead, comprising:
inserting a first length of cable into the length of conduit, the first length of cable being substantially equal to the length of conduit; and
inserting a second length of cable into the length of conduit such that the cable buckles and contacts an interior surface of the conduit at a plurality of locations across substantially the entire length of conduit to prevent longitudinal movement of the cable within the conduit.
- [c15] The method of claim 14, further comprising:
connecting an electric submersible pumping system to one end of the conduit.
- [c16] The method of claim 15, further comprising:
operatively connecting one end of the cable to an electric motor of the electric submersible pumping system.
- [c17] The method of claim 14, wherein inserting the first length of cable comprising:
connecting a pull rope to one end of the cable; and
pulling the first length of cable into the conduit.

- [c18] The method of claim 17, wherein inserting the second length of cable comprising:
pumping the second length of cable into the conduit to buckle the cable substantially uniformly across substantially the entire length of conduit.
- [c19] The method of claim 14, wherein inserting the first and second lengths of cable comprising:
pumping the first and second lengths of cable into the conduit to buckle the cable substantially uniformly across substantially the entire length of conduit.
- [c20] The method of claim 14, further comprising:
reeling the length of conduit and first length of cable within the conduit onto a spool.
- [c21] The method of claim 20, wherein the second length of cable being inserted into the length of conduit as the conduit is unspooled and deployed downhole.
- [c22] The method of claim 20, wherein the second length of cable being inserted into the length of conduit before the conduit is unspooled and deployed downhole.
- [c23] The method of claim 20, wherein the spool is an oscillating, vertically-oriented spool.
- [c24] The method of claim 23, wherein inserting the second

length of cable comprising:

feeding the second length of cable into the conduit using a cable feeding unit to buckle the cable substantially uniformly across substantially the entire length of conduit.

[c25] A method of installing a cable within a length of conduit during fabrication of the conduit, comprising:

rolling a strip of metal to create a length of tubular material;

inserting a length of cable into the tubular material, wherein the cable buckles and contacts an interior surface of the tubular material at a plurality of locations across substantially the entire length of tubular material to prevent longitudinal movement of the cable within the tubular material; and

sealing the tubular material to create a conduit having a buckled cable disposed therein.

[c26] The method of claim 25, wherein sealing the tubular member comprises:

welding and annealing the tubular material.

[c27] A method of installing a cable within a conduit, comprising:

inserting the cable into the conduit, the cable having a length greater than a length of the conduit;

distributing the cable substantially evenly within the conduit.

[c28] The method of claim 27, wherein the cable buckles to define an arcuate path within the conduit and contacts an interior surface of the conduit at a plurality of locations across substantially the entire length of conduit to prevent longitudinal movement of the cable within the conduit.

[c29] The method of claim 28, wherein a least a portion of the cable defines a helical path within the conduit.

[c30] The method of claim 27, wherein the difference between the length of cable and the length of conduit is substantially equal to or greater than 0.5 feet of cable per 1000 feet of conduit.

[c31] The method of claim 27, further comprising:
deploying the conduit in a well, wherein the distribution of cable within the conduit remains substantially even.

[c32] A conduit having a length, comprising:
a cable arranged within the conduit, the cable having a length that is greater than the length of the conduit, the cable being substantially evenly distributed within the conduit.